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Evaluation of Beef Meat Quality at Slaughterhouse in Kendari City

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Abstract. This study aims to find out whether DFD (Dark, Firm, and Dry) and PSE (Pale, Soft, and Exsudative) happen/ occur to Bali Cattle Carcas slayed in Anggoeya Animal Slaugtherhouse in Kendari City. This study is useful to give information about the meats' DFD and PSE cases and carcas quality at Anggoeya Slaugtherhouse in Kendari City. The sample of this study are 6 bulls and 6 cows taken from slaugtherhouse in Kendari City. The obtained data was, then, analyzed descriptively based on the mean and deviation standard ($\chi \pm$ SD).The variables observed in this studyincludes PH measurement for 1 – 6 hours after slashing, color, loss of mass, texture, hardness, and humidity. The meats were found to be around normal PH 5.55 – 5.73. Based on the color score AUS_MEAT Colour, the color of the meats were around the score of 4 – 5, loss of mass were around 30,64 – 43,28%. Based on panelis judgement, most of the meats texture were scored 3 or were in moderate level. Most of the meats' elasticity were scored 3 or were rather soft, while most of the meats' humidity were scored 3 or moderate (62.50%). On the meats produced by the Animals Slaugtherhouse in Kendari City, no changes to DFD (Dark, Firm, and Dry) or PSE (Pale, Soft and Exudative) was found.

Keywords : *DFD, PSE, Carcasses, Bali Cattle*

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1. Introductions

Meat Safe, Healthy, Whole and Halal (ASUH) is a need that is highly emphasized by consumers. Until now, the existence of these facilities and infrastructure, especially meat sales kiosks, have largely not met the minimum sanitation hygiene requirements so that they have not met ASUH criteria (Directorate for Kesmavet, 2005).

ASUH beef can be obtained if the process of handling from the process of transportation to the feeding process undergo a good meat processing procedure. The process of handling livestock from the time of transportation to the process of slaughtering has a relationship with good or bad meat produced (Hafid et al. 2010).

Carcasses obtained from good slaughtering animals will certainly produce meat that is safe for consumption because it has gone through good slaughtering standards in slaughterhouses because it has been examined for possible disease (Hafid, 2008; 2011). Healthy meat will also not be obtained from slaughterhouses that meet the standards because sick animals that have the potential to produce unhealthy meat will not be slaughtered. Halal meat is meat obtained from slaughter according to

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Islamic law. Based on preliminary observations made at the slaughterhouse of the City of Kendari, some of the newly arrived cattle were immediately slaughtered and had not yet been rested, fasted, and health checks were carried out on the animals.

In connection with the description, it is necessary to carry out research on the physical and organoleptic quality of the bali beef carcass produced at the slaughterhouse in Kendari City especially on the possibility of the occurrence of dark, dry and rough meat or often also known as dark, firm and dry (DFD) also to the possibility of the occurrence of pale, soft and runny meat or called Pale, Soft and Exsudative (PSE) which is of very low quality and can also be investigated on the quality of carcasses cut at Kendari Slaughterhouse of Kendari City.

2. Materials and Methods

The research material used in this study was the longissimus dorsi muscle of male and female bali cattle each with 6 heads that have a uniform age (2-3 years). The tools used in this research are in the form of digital pH meters, digital scales, furnaces, glass cups, cutters, cutters, aquadest, and blenders.

The study was conducted by direct observation of a number of cows made into samples to be tested in the laboratory. Primary data is data obtained by direct observation of meat shortly after being cut, meat texture, meat color, hardness of meat, and moisture of meat owned by the meat under study

3. Results and Discussion

Meat has a meat structure consisting of muscle tissue, connective tissue, blood vessels and nerve tissue. According to SNI (1995) tendon attached to the skeleton, except tendon from the lips, nose and ears that come from healthy cows / buffaloes when slaughtered.

DFD (Dark Firm Dry) meat, which is dark, hard-textured, dry meat, has a high pH value and high water binding capacity (Arief et al., 2000; Hafid, 2010; 2011). Conversely, due to stress factors and other factors not yet known, the decrease in pH can take place very quickly and is very low.

1. Meat pH

Graph 1. Observation Results of pH

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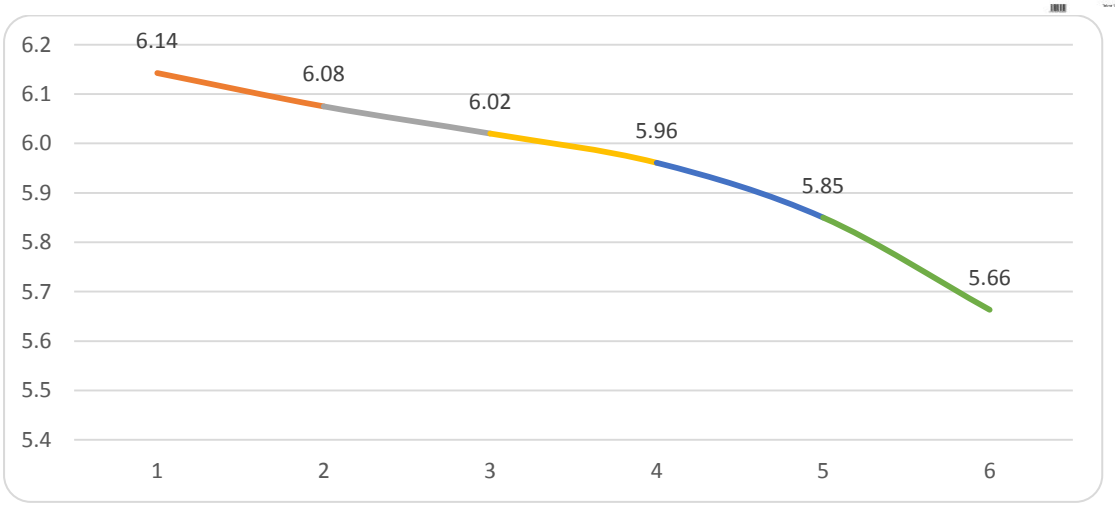

The pH of Bali beef after being observed for 6 hours after slaughtering is still in normal condition, ranging from 5.55 to 5.73 as in Appendix 1. The decrease in pH that occurs in male and female cattle is still in normal level because it is still in the threshold Normal meat pH ie normal muscle tissue pH from 6.5 to 6.6 will drop to 5.3-5.5 (Koswara, 2009). Based on the results of research conducted by Prasetyo et al. (2013) in three Malang City Markets namely Dinoyo Market, Blimbing Market and Besar Market, the average pH of the three markets in Malang has an average of 5.63. Results of research conducted by Prasetyo et al. (2013) when compared with research conducted at the Kendari City Slaughterhouse did not have much difference because the average obtained in this study was a pH value of 5.95.

2. Comparison of Meat Color

Table 1. Color Observation Results

	Colour Score								
Sample	**0**	**1b**	**1c**	**2**	**3**	**4**	**5**	**6**	**7**
Female 1	0	0	0	0	0	0	1	0	0
Female 2	0	0	0	0	0	1	0	0	0
Female 3	0	0	0	0	0	0	1	0	0
Female 4	0	0	0	0	0	0	1	0	0
Female 5	0	0	0	0	0	0	1	0	0
Female 6	0	0	0	0	0	0	1	0	0
Male 1	0	0	0	0	0	0	1	0	0
Male 2	0	0	0	0	0	1	0	0	0
Male 3	0	0	0	0	0	1	0	0	0
Male 4	0	0	0	0	0	0	1	0	0
Male 5	0	0	0	0	0	0	1	0	0

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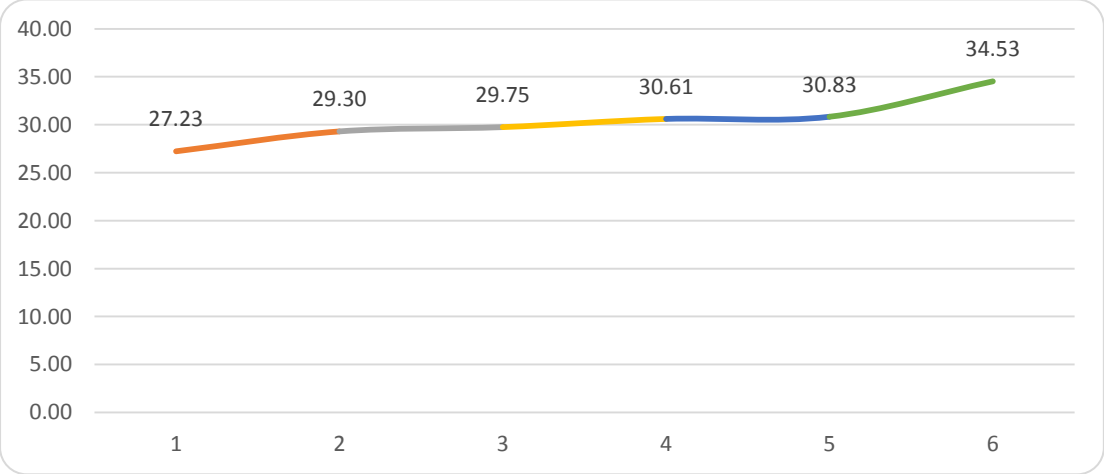
Male 6	0	0	0	0	0	1	0	0	0
Frequency	**0**	**0**	**0**	**0**	**0**	**4**	**8**	**0**	**0**
Percentage (%)	**0**	**0**	**0**	**0**	**0**	**33,33**	**66,67**	**0**	**0**

Measuring the color of beef using a standard color of beef with a score of 1-9, ranging from pink to dark red, that is bright red (score 0–3), dark red / slightly darker (score 4–5) and color dark red (score 6-7) (Meat and Livestock Austalia, 2012). Comparison of meat color in Bali beef after measuring for 6 hours after slaughtering resulted in the frequency occurrence of score 4 in bright red as much as 33.33% while the frequency of occurrence of score 5 in red as much as 66.67%. This shows the color of bali beef slaughtered at the Kendari City Slaughterhouse is the normal color of beef and not identified by DFD and PSE. Based on the results of research by Kuntoro et al. (2013) LD meat has a score of 6 (bright red), while BF meat has a score of 7 (red is a bit darker). From the results of research by Kuntoro et al. (2013), the color of meat produced with different scales but has the same color because the color standard used by Kuntoro et al. (2013) is the meat color standard SNI 3932: 2008 while the scale used in this study is AUS-MEAT color scale.

3. Shrink Cook

Graph 2. Observation Results of Shrinkage Cook



Cooking loss is the weight lost or the weight loss of meat samples due to cooking (Hafid et al, 2019). Cook losses on bali beef after measuring for 6 hours after cutting are under normal conditions between 30.64-43.28. According to Soeparno (2009) the percentage of cooking beef shrinkage is in the normal range of 15-40%. The lower the shrinkage of cooked meat the better the quality of the meat. It was further said that meat that had a low amount of cooking shrinkage had better quality

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because of the loss of nutrients during cooking would be less. The value of cooked beef shrinkage based on the research of Brahmantiyo (2000) ranged from 37.53 to 38.34%, while the research of Yanti et al. (2008). That the value of cooked beef shrinkage ranges from 42.77 to 44.65%. Based on the results of research conducted there are differences with the literature obtained as has been done by Brahmantyo (2000), because the beef used by Brahmantyo is a European cow while the cows used in this study are different bali cattle from cows Europe in general.

4. Meat Texture

Table 3. Observation Results of Meat Texture

	Number of Panelist									
Score	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Frequency**	**Percentage**
1	0	0	0	0	0	0	0	0	0	0,00
2	4	3	3	3	7	5	6	3	34	35,42
3	5	7	6	4	5	6	3	5	41	42,71
4	3	2	3	5	0	1	3	4	21	21,88
5	0	0	0	0	0	0	0	0	0	0,00
Total	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**96**	**100%**

The physical quality of beef is influenced by many factors including the nation and gender of local cattle having different nationalities local beef is bright red, very little fat, with a rather smooth texture Tambunan (2001). After the panelist test conducted on Bali beef obtained the highest frequency of occurrence as much as 42.71% on a score of 3 which means the texture of meat is of medium value. The texture of meat produced from research Prasetyo (2013) the texture of meat produced in 3 markets in Malang has a smooth texture and produces soft meat. This is in accordance with research that has been done in the Kendari City RPH that uses a panelist test that produces the highest frequency of events at a score of 3 being 42.71% and the next highest score is a score of 2 which means smooth as much as 35.42%.

2. Firmness of Meat

Table 3. Observation Results of Meat Firmness

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Number of Panelist										
Score	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Frequency**	**Percentage**
1	0	0	0	0	0	0	0	0	0	0,00
2	3	3	5	3	4	4	5	4	31	32,29
3	8	8	7	6	7	8	4	8	56	58,33
4	1	1	0	3	1	0	3	0	9	9,38
5	0	0	0	0	0	0	0	0	0	0,00
Total	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**96**	**100**

Antemortem and postmortem are two factors that affect meat tenderness. Antemortem factors such as genetics, including nation, species, and physiology, gender, age, management and stress. Changes in meat tenderness or texture when wilted are affected by changes in the holding capacity of the water. After the panelist test conducted on Bali beef the meat hardness data obtained obtained the highest frequency of occurrence at a score of 3 which means the value of mild softness was 58.33%. Hardness of meat obtained from the slaughterhouse of Kendari City tends to have a rather rough texture. The results of this study are not much different from the observations of Anonymous (2015) who obtained the value of beef violence with an average of 2.5. Score 2 which means soft and score 3 which means rather soft, the results of observations indicate panelists prefer elasticity in beef samples. The ability of meat to maintain water content affects the level of hardness of meat.

5. Meat Moisture / Dryness of Meat

Table 4. Observation Results of Meat Moisture / Meat Dryness

Number of Panelist										
Skor	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Frequency**	**Percentage**
1	0	0	0	0	0	0	0	0	0	0.00
2	5	6	4	2	1	2	4	5	29	30.21
3	6	6	8	8	10	9	7	6	60	62.50
4	1	0	0	2	1	1	1	1	7	7.29
5	0	0	0	0	0	0	0	0	0	0.00
Total	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**96**	**100**

Good meat quality in terms of meat color, appearance, odor, level of elasticity and moisture content or level of wetness of meat if held (Astawan, 2008; Hafid, 2011; 2018). After a panelist test on bali beef, the meat moisture / wetness data obtained with the highest frequency of occurrence occurred at a score of 3 which means medium, no liquid but the meat feels wet to the touch, fingers remain dry as much as 62.50%. The results of research that have been done do not have much

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difference with the results of Anonymous (2015) observations of beef humidity value is 2.76 while the humidity of sample meat, with a score of 3 means rather dry.

3. Conclusion

Meat produced in Kendari City Slaughterhouse did not find meat that experienced changes in meat to DFD (Dark, Firm and Dry) or PSE (Pale, Soft and Exudative), meat in the normal pH range of 5.55-5.73, Based on the AUS_MEAT color score, the color of meat in Kendari City Slaughterhouse ranges from a score of 4-5, the cooking losses of meat ranges from 30.64 to 43.28%.), the most meat thickness was score 3 or slightly soft (58.33%) and the most meat moisture was score 3 or moderate (62.50%).

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